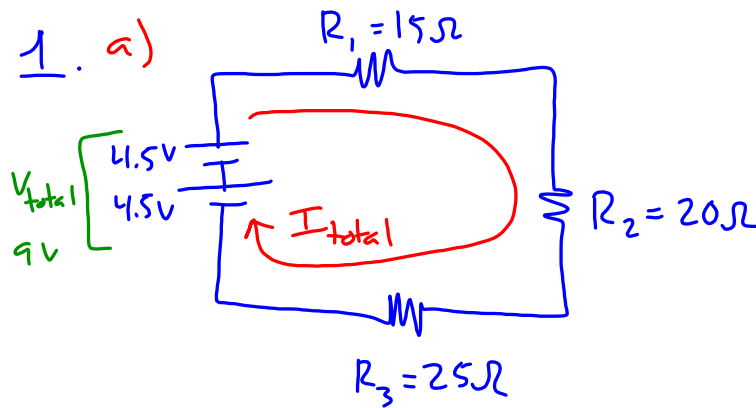


1. TWO 4.5 V batteries are connected in series with three resistors. R1 has a value of 15 ohms, R2 has a value of 20 ohms, and R3 has a value of 25 ohms.

- Draw the circuit.
- Calculate the total resistance and total current.
- Calculate the voltage across each resistor.



b)

$$R_{total} = R_1 + R_2 + R_3$$

$$= 15\Omega + 20\Omega + 25\Omega$$

$$= 60\Omega$$

$$I_{total} = \frac{V_{total}}{R_{total}}$$

$$= \frac{9V}{60\Omega}$$

$$= 0.15A$$

c)

$$V_1 = I_{total} R_1 \quad V_2 = I_{total} R_2 \quad V_3 = I_{total} R_3$$

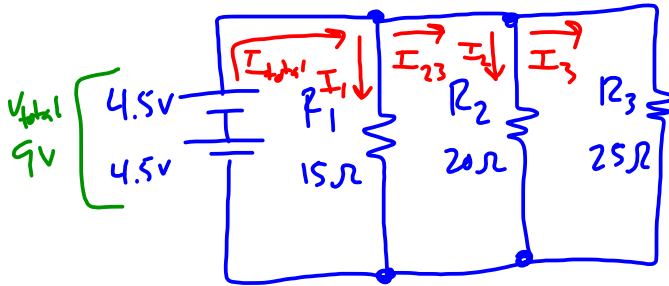
$$= (0.15A)(15\Omega) \quad = (0.15A)(20\Omega) \quad = (0.15A)(25\Omega)$$

$$= 2.25V \quad = 3.0V \quad = 3.75V$$

2. TWO 4.5 V batteries are connected in parallel with three resistors, with each resistor on an individual branch. R1 has a value of 15 ohms, R2 has a value of 20 ohms, and R3 has a value of 25 ohms.

- Calculate the current in each branch.
- Calculate the total current.

1.



$$\begin{aligned}
 a) \quad I_1 &= \frac{V_{total}}{R_1} & I_2 &= \frac{V_{total}}{R_2} & I_3 &= \frac{V_{total}}{R_3} \\
 &= \frac{9V}{15\Omega} & &= \frac{9V}{20\Omega} & &= \frac{9V}{25\Omega} \\
 &= 0.6A & &= 0.45A & &= 0.36A
 \end{aligned}$$

$$\begin{aligned}
 b) \quad I_{total} &= I_1 + I_2 + I_3 \\
 &= 0.6A + 0.45A + 0.36A \\
 &= 1.41A
 \end{aligned}$$